

Applicant : Lim et al.
Serial No. : 10/707,142
Filed : November 24, 2003
Page : 7 of 10

Attorney's Docket No.: 12406-091001 / P2002,1004 US
E1

REMARKS

In reply to the Office Action of June 3, 2005, Applicant submits the following remarks. Claims 1, 8 and 16 have been amended. Claims 17-19 are new. No new matter has been added. Applicant respectfully requests reconsideration in view of the foregoing amendments and these remarks.

Examiner Interview

The applicant thanks Examiner Erdem for granting a telephone interview with the applicant's representatives, Jennifer Zanolco and David Goren on August 2, 2005. During the interview, the attendees discussed claim 1 and figures 4A and 10 of the applicant's specification. In addition, the attendees discussed Nagayama '055, in particular the cover figure, and Uematsu, in particular Figs. 2A, 2B and 2C. The attendees discussed amending the independent claims to further describe the direction of pillar and electrode elongation.

Section 103 Rejections

Claims 1 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,373,187 ("Nagayama '187") in view of U.S. Patent No. 4,916,503 ("Uematsu") and further in view of Patent No. 5,701,055 ("Nagayama '055"). The applicant respectfully disagrees.

Amended claim 1 recites a device having a substrate with a plurality of electrodes defines thereon. The electrodes are confined to an electrode region and have a first length along a first direction parallel to a surface of the substrate and a first width along a second direction parallel to the surface of the substrate and perpendicular to the first direction, the first length being greater than the first width. The device also has a plurality of pillars parallel to one another. The pillars have a second length and a second width, the second length being greater than the second width and extending along the first direction so that the plurality of pillars are parallel to the plurality of electrodes. The plurality of pillars have a profile where a pillar has a lower portion and an upper portion that is wider in the second direction than the lower portion. The plurality of

Applicant : Lim et al.
Serial No. : 10/707,142
Filed : November 24, 2003
Page : 8 of 10

Attorney's Docket No.: 12406-091001 / P2002,1004 US
E1

pillars extend along the first direction past ends of the plurality of electrodes and outside the electrode region of the substrate to prevent electrical shorting.

Nagayama '055 describes a device with a substrate 2 having ramparts 7 with overhanging portions 7a projecting in a direction parallel to the substrate 2 (Fig. 2, col. 6, lines 26-12). Electrodes 9 are formed parallel to the ramparts 7 (col. 6, lines 53-59).

Uematsu shows electrodes 23 on a top surface of a base layer 21 (Fig. 2A, column 6, lines 18-52). A bottom electrode 25 is located across the bottom of base layer 21 and the electrodes 23 across the top of the base layer 21 (Figures 2B and 2C, column 6, lines 18-52). An oxide film 26 is applied to the base layer 21 and grooves are formed in the film 26 so that the subsequently applied electrodes 23 can contact the emitter 22 (*id.*). The electrodes 23 are formed on the oxide film 26 using vapor deposition and lift-off techniques (*id.*).

The Examiner notes that Nagayama '187 fails to "disclose the required electrode region and required configuration where past ends of pillars extend past ends of the electrodes". For this feature, the Examiner turns to Uematsu and Nagayama '055. While Nagayama '055 has ramparts 7 and overhanging portions 7a that extend along one direction and electrodes that extend along the same direction, Nagayama '055 fails to suggest or disclose a plurality of pillars and a plurality of electrodes that extend along a first direction where the plurality of pillars extend in the first direction past ends of the plurality of electrodes and outside an electrode region. Rather, Nagayama '055 shows both the electrodes 9, the pillars 7 and the overhanging portions 7a as extending to the edge of substrate 2 (Fig. 2). Further, Nagayama '055 describes the overhanging portions 7a as having a T-shaped cross section and the width of the overhanging portion 7a protrudes from the rampart 7 body side (col. 7, lines 38-56). The overhanging portion 7a is not described as extending beyond an end of the rampart 7.

Uematsu also has electrodes 23 that are parallel to one another (Fig. 2A). An oxide film 26 separates the electrodes 23 (Fig. 2C). Uematsu fails to suggest or disclose a plurality of pillars and a plurality of electrodes that extend along a first direction where the plurality of pillars extend in the first direction past ends of the plurality of electrodes and outside an electrode region. Uematsu only shows the oxide film 26 as between the electrodes 23 (Fig. 2C).

Applicant : Lim et al.
Serial No. : 10/707,142
Filed : November 24, 2003
Page : 9 of 10

Attorney's Docket No.: 12406-091001 / P2002,1004 US
E1

Further, the oxide film 26 would not need to extend beyond ends of the electrodes, because the lift-off technique can eliminate any unwanted areas of electrode, thereby preventing shorting.

Because Nagayama '187, Nagayama '055 and Uematsu all fail to suggest or disclose a plurality of pillars and a plurality of electrodes that extend along a first direction where the plurality of pillars extend along the first direction past ends of the plurality of electrodes and outside the electrode region, the applicant submits that no *prima facie* case of obviousness has been made with respect to claim 1. Claim 7 depends from claim 1 and is similarly not obvious over the combination of Nagayama '187, Nagayama '055 and Uematsu.

Claims 2-6 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagayama '187 in view of Uematsu and further in view of U.S. Patent No. 6,111,356 ("Roitman") and further in view of Nagayama '055. Claims 8-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagayama '187 in view of Uematsu and further in view of Roitman, U.S. Patent No. 6,140,009 ("Wolk") and Nagayama '055. The applicant respectfully disagrees.

Claims 8 and 16 are independent claims. Each of amended claims 8 and 16 recites a device having a substrate with a plurality of electrodes defines thereon. The electrodes are confined to an electrode region and have a first length along a first direction parallel to a surface of the substrate and a first width along a second direction parallel to the surface of the substrate and perpendicular to the first direction, the first length being greater than the first width. The device also has a plurality of pillars parallel to one another. The pillars have a second length and a second width, the second length being greater than the second width and extending along the first direction so that the plurality of pillars are parallel to the plurality of electrodes. The plurality of pillars extend along the first direction past ends of the plurality of electrodes and outside the electrode region. The remainder of the rejected claims depend from one of claims 1, 8 or 16.

Roitman and Wolk fail to suggest or disclose a plurality of pillars and a plurality of electrodes that extend along a first direction where the plurality of pillars extend along the first direction past ends of the plurality of electrodes and outside the electrode region. Because

Applicant : Lim et al.
Serial No. : 10/707,142
Filed : November 24, 2003
Page : 10 of 10

Attorney's Docket No.: 12406-091001 / P2002,1004 US
E1

Nagayama '187, Uematsu, Roitman, Nagayama '055, and Wolk all fail to suggest or disclose these features, no *prima facie* of obviousness has been made with respect to claims 8 or 16, or claims 2-6 or 9-15. The applicant requests that the obviousness rejections be withdrawn.

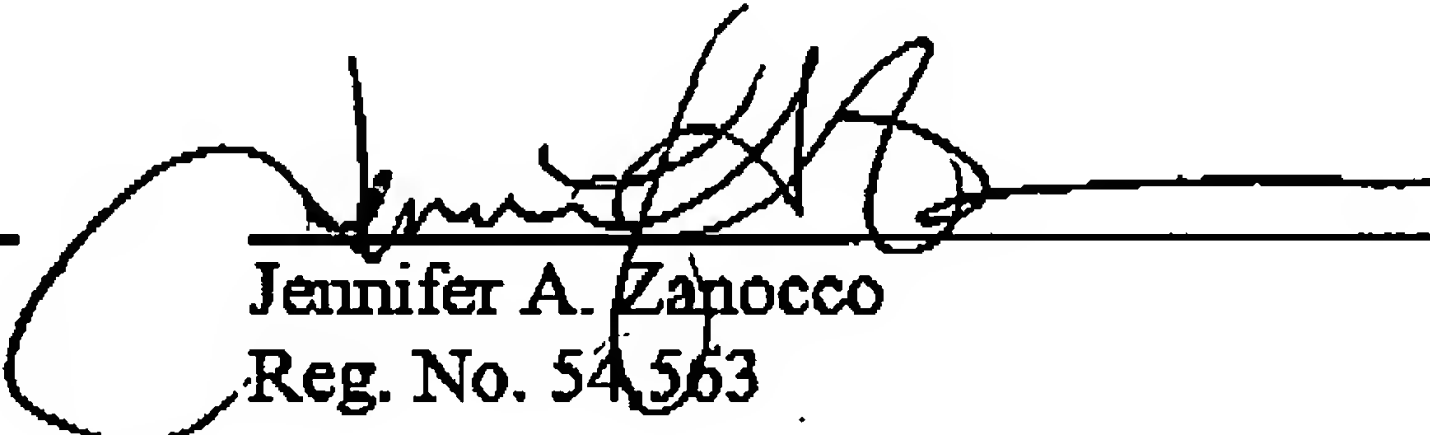
New Claims

Claims 17 -19 are new. Each of the claims depends from a currently pending claim. No new matter has been added.

No fee is believed to be due. If, however, there are any charges or credits, please apply them to Deposit Account No. 06-1050.

Respectfully submitted,

Date: Aug. 30, 2005


Jennifer A. Zappocco
Reg. No. 54,563

Customer No. 26181
Fish & Richardson P.C.
Telephone: (650) 839-5070
Facsimile: (650) 839-5071

50281443.doc